How to Buy an Energy-Efficient Room Air Conditioner

Energy Efficiency and Renewable Energy
Federal Energy Management Program

Why Agencies Should Buy Efficient Products

- *Section 161 of the Energy Policy Act of 1992 (EPACT) encourages energy-efficient federal procurement. Executive Order 12902 and FAR section 23.704 direct agencies to purchase products in the upper 25% of energy efficiency.*
- *Agencies that use these guidelines to buy efficient products can realize substantial operating cost savings and help prevent pollution.*
- *As the world's largest consumer, the federal government can help "pull" the entire U.S. market towards greater energy efficiency, while saving taxpayer dollars.*

Federal Supply Sources:

- General Services Administration (GSA)
  Phone: (816) 926-2389 (Gail Allen)
  www.fss.gsa.gov
- Defense Logistics Agency (DLA)
  Phone: (800) DLA-2852 or (215) 697-0235
  DSN 442-0235 (Vicki Lee)
  dscp103.dscp.dla.mil/gi/general/pgac.htm

For More Information:

- DOE's Federal Energy Management Program (FEMP) Help Desk and World Wide Web site have up-to-date information on energy-efficient federal procurement, including the latest versions of these recommendations.
  Phone: (800) 363-3732
  www.eren.doe.gov/femp/procurement
- DOE has ENERGY STAR® room air conditioner model listings.
  Phone: (800) 363-3732
  www.energystar.gov
- American Council for an Energy-Efficient Economy (ACEEE) publishes the *Consumer Guide to Home Energy Savings*.
  Phone: (202) 429-0063
  aceee.org
- Consumers Union publishes the *Consumer Reports Annual Buying Guide*, and provides an on-line room air conditioner sizing guide.
  Phone: (800) 500-9760
  www.consumerreports.org
- Air Conditioning Contractors of America (ACCA) publishes *Manual J*, a load calculation guide for residential heating and air conditioning.
  Phone: (202) 483-9370
  www.acca.org
- *Home Energy* magazine provides energy conservation tips on air conditioning.
  Phone: (510) 524-5405
  www.homeenergy.org
- Lawrence Berkeley National Laboratory provided supporting analysis for this recommendation.
  Phone: (202) 484-0880

Efficiency Recommendation

Product Type and Cooling Capacity	Recommended EER[a]	Best Available EER
with louvers[b]; < 6,000 Btu/hr	9.2 or more	10.0
with louvers; 6,000-19,999 Btu/hr	10.0 or more	11.7
with louvers; ≥ 20,000 Btu/hr	9.2 or more	10.0
without louvers; all cooling capacities	9.2 or more	9.5

a) Based on DOE test procedure; see 10 CFR 430, Sup-part B, Appendix F.

b) Louvered sides improve the energy performance of window-installed A.C. units by enhancing airflow over the outdoor coil. Units intended for through-the-wall installation require a smooth-sided cabinet (no louvers).

Definitions

Cooling Capacity is the amount of cooling that can be provided by the unit (in Btu/hr) at standard rating conditions.

EER, or Energy Efficiency Ratio, is equal to the measured cooling capacity of the unit (in Btu/hr) divided by its electrical input (in watts) at standard rating conditions.

Where to Find Energy-Efficient Room Air Conditioners

The federal supply sources for room air conditioners are the Defense Logistics Agency (DLA) and the General Services Administration (GSA). DLA's FED LOG purchasing software includes EERs of room air conditioners. GSA sells room air conditioners through Schedule 41-I, as well as through its on-line shopping network, *GSA Advantage!* (starting in 1999). Look for products that meet the recommended efficiency levels.

When buying from a commercial source (retailer or distributor), choose models that qualify for the EPA/DOE ENERGY STAR® label (see "For More Information), all of which meet the recommended levels. Some manufacturers and retailers display the label on complying models. Alternatively, look at the yellow "EnergyGuide" label to identify models with EERs that meet these Efficiency Recommendations. For a contractor-supplied air conditioner, specify an EER that meets the recommended level for that type and size.

Sizing

Oversizing of air conditioners, besides raising purchase cost, will lead to excessive energy consumption and poor humidity removal due to excessive on-off cycling. The required air conditioner capacity should be determined based on the referenced ACCA or Consumer Reports calculation procedures (see "For More Information").

Environmental Tips

Refrigerants with ozone-destroying chlorofluorocarbons (CFCs) were used many years ago in room air conditioners but most existing equipment today uses HCFC refrigerants, which have a much lower ozone-depleting effect; ask your supplier for information. In the future, room air conditioners with ozone-safe refrigerants are expected to be available.

When retiring an air conditioner which contains CFCs or HCFCs, the Clean Air Act requires that the refrigerant be recovered prior to final disposal of the appliance. For compliance information, contact the EPA Stratospheric Ozone Information Hotline at (800) 296-1996.

Room Air Conditioner Cost-Effectiveness Example (10,000 Btu/hr - louvered)

Performance	Base Model[a]	Recommended Level	Best Available
EER	9.0	10.0	11.7
Annual Energy Use	830 kWh	750 kWh	640 kWh
Annual Energy Cost	$50	$45	$38
Lifetime Energy Cost	$500	$450	$390
Lifetime Energy Cost Savings	-	**$50**	**$110**

a) The efficiency (EER) of the Base Model is just sufficient to meet current U.S. DOE national appliance standards.

Definition

Lifetime Energy Cost is the sum of the discounted value of annual energy costs based on average usage and an assumed air conditioner life of 15 years. Future electricity price trends and a discount rate of 4.1% are based on federal guidelines (effective from April, 1998 to March, 1999).

Cost-Effectiveness Assumptions

Annual energy use in this example is based on the standard DOE test procedure for a louvered model with a cooling capacity of 10,000 Btu/hr and 750 operating hours per year. The assumed electricity price is 6¢/kWh, the 1996 federal average electricity price in the U.S.

Using the Cost-Effectiveness Table

In the example shown above, a room air conditioner with an EER of 10.0 is cost-effective if its purchase price is no more than $50 above the price of the Base Model. The Best Available model, with an EER of 11.7, is cost-effective if its price is no more than $110 above the price of the Base Model.

What if my Electricity Price or Operating Hours are different?

To calculate Lifetime Energy Cost Savings for a different electricity price, multiply the savings in the above table by this ratio: $\left(\frac{Your\ price\ in\ ¢/kWh}{6.0\ ¢/kWh}\right)$. Similarly, for a different operating hours figure, multiply the savings by this ratio: $\left(\frac{Your\ operating\ hours}{750\ hours}\right)$.

Metric Conversions

1,000 Btu/hr = 293 watts
*°F = (1.8 * °C) + 32*